Art. XIV.—*On an Apparently New Type of Cetacean Tooth from the Tertiary of Tasmania.*

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(With Plate XXVII.)

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Introduction.

The fossil tooth which forms the subject of the following note was kindly lent to the National Museum by Mr. H. H. Scott, the Curator of the Victoria Museum, Launceston, with permission for its description. It was bequeathed to the Victoria Museum by Miss Lodder, who found it in 1897 washed up with "two other (?) similar fossils," at the mouth of the Leven, at Ulverstone, about 28 miles east of Table Cape.

It seems probable from the comparable evidence obtainable regarding the relationship of this tooth that it is allied to that of the Sperm Whale, but with the difference that, instead of being a curved, cylindrical cone, the tooth is much flattened in contour, has an extremely wide base and a bevelled apex or crown. The absence of any true enamel at the apex further points to its relationship with the *Physeteridae*. It is without doubt a tooth of the mandibular series, those of the upper jaw in this family being stunted, and are buried in the dense ligamentous gum.[1] In view of its apparent distinctness from the living *Physeter macrocephalus* a new generic name is here suggested.

Genus **Scaptodon**,[2] nov.

Generic Characters.—Tooth conical, depressed, curved, gradually tapering from base to apex, depressed elliptical in section. Root much larger than crown. Base of crown not contracted.

1. See Tomes: Manual of Dental Anatomy (7th ed., Tims and Hopewell-Smith), 1914, p. 493. Also Ritchie and Edwards: "On the occurrence of functional teeth in the upper jaw of the sperm whale." Proc. R. Soc. Edin., vol. xxxiii., pt. ii., No. 15, 1913, pp. 166-168, pl. xxxiii. Those authors show that the maxillary teeth of *Physeter macrocephalus* are flattened at the apex and oval in section; they bear no resemblance to the present form of tooth.

2. From σκαπτω, to dig, and ὀδους, a tooth, in allusion to the trowel-ended apex.

Pulp cavity moderately deep. Root entirely covered with cement. Crown bevelled on inner, concave side and surface radiately grooved.

Scaptodon lodderi, gen. et. sp. nov. (Plate XXVII., Figs. 1-3).

Description.—Tooth (mandibular), large, conical, tapering from a wide base to a narrow crown; much depressed and widely curved, in basal section, long elliptical. The base is open, and has a moderately deep pulp cavity. The whole of the root, so far as preserved, was covered with a fairly thick layer of cement; the surface is relieved by a series of shallow longitudinal furrows extending from the base through more than half the length. The crown can scarcely be separated, being continuous in contour, with the root, and is apparently marked off at the limit of the bevel. The apex of the crown is bevelled to a sharp cutting edge towards the convex side, the bevelled surface being marked with some low radiating ridges producing a few serrations on the cutting edge, the latter having a parabolic curvature.

Measurement.—Length of tooth, measured along the convex face, 113 mm. Greatest width of tooth at base of root, 41 mm.; width at base of bevel, 13 mm.; thickness at base of tooth, 19.25 mm.; thickness at base of bevel, 7.5 mm.; depth of pulp cavity, 36.5 mm.; weight, 46.5 dwts (troy), or 161 kilogrammes.

Microscopic Structure of the Tooth.—A thin transverse section was taken through the wall of the tooth at the base, bordering the pulp cavity. The intermediate layer is of the nature of ivory like that of the Cachalot,[1] and the outer and inner margins, each about one quarter of the thickness of the middle layer, show the structure of cement. Under a 1-inch objective (about 52 diameters), the cement layer, about 5 mm. in thickness, is homogeneous in structure, but in this specimen is crowded with ramulose borings of a parasitic fungus, the hyphal tubes being filled with dark material, probably due to the grinding; isolated spores are also seen here and there.

The intermediate layer, the dentine or ivory, shows a dense structure composed of a closely set series of minute dentinal tubes transversely arranged, whilst circumferentially, or crossing these tubes, are parallel lines of greater density at varying distances, probably contour lines. The intermediate ivory layer in the slide examined measures 2 mm. in width.

1. See Owen. Odontography, 1845, p. 356, pl. lxxxix., fig. 2.

A higher power ($\frac{1}{9}$in. giving 380 diameters) shows the cementum, where not obscured by the hyphae of the boring fungus, to be fairly homogeneous, excepting near the inner dentinal layer, where it is penetrated by the dentinal tubes, which ramble away from their parallel structure in the ivory. The dentinal tubes are crossed by numerous lines of ivory globules and interglobular spaces, probably air-filled. The dentinal tubes are spaced in each optical layer, 15μ apart. The hyphal tubes of the parasitic fungus have an average diameter of 5μ.

Observations.—In the microscopic structure of the above tooth there is sufficient evidence to show its close relationship to the living sperm whale, *Physeter;* but the flattened form of the tooth, which is long—elliptical in section, is a very distinct feature, for only in very extreme examples of that genus can one find a tooth having a broadly elliptical outline. The widely separable forms of tooth base and apex in the two genera are very apparent. In *Physeter* the base is always more or less cylindrical, or even tapering, and the point of the tooth, when depressed, is not hollowed and scalprate as in the above described form.

The heavy, flattened root and moderately deep pulp cavity reminds one of the tooth of *Hoplocetus*, but in that genus the crown is separated from the root by a constriction, and the tooth is fusiform in shape and not wide at the base, and gradually tapering, as in the present form. In reply to a note and sketch of this specimen, which I sent Dr. C. W. Andrews, F.R.S., of the British Museum, he has kindly remarked that it does not agree with *Hoplocetus* as figured by Gervais—whose works, by the way, in the Zoologie et Paléontologie Françaises (vol. I. 1848-52, p. 161) and the Osteographie des Cétacés (p. 345), are not in Melbourne. In view of the fact that the cement layer in this tooth extends over the convex surface almost up to the cutting edge of the apex, there could have been little of the crown exposed, and in view of this character the affinities of the tooth appear to lie with modern sperm whales as *Physeter*.

A rolled and otherwise abraded cetacean tooth figured by E. Ray Lankester in 1867[1] from the Red Crag of Suffolk, may have some generic affinity with the present form. It is stout and fusiform, with a compressed crown, which, so far as the rather obscure sketch shows, is marked with radiating furrows, as in the Table Cape specimen.

1. Trans. Roy. Micr. Soc. Lond., vol. xvi., 1867, pp. 63, 64 (fig. 3).

In the absence of any further evidence as to the relationship of the Tasmanian fossil tooth with already described forms, it is here provisionally referred to a new genus, *Scaptodon*. The stained and fossilised appearance of the tooth leaves no doubt that it was derived from a Tertiary deposit of some considerable age.

Occurrence.—"Found washed up at Ulverstone, N.W. Tasmania, after a heavy gale."—H. H. Scott, Victoria Museum, Launceston, Tasmania. Probably from either Janjukian or Kalimnan beds of the Table Cape series of Tasmania (Miocene or Lower Pliocene).

In writing the above I wish to express my thanks to Mr. J. A. Kershaw, F.E.S., for facilities in examining recent specimens, and to Dr. E. Brooke Nicholls, for useful references and suggestions.

EXPLANATION TO PLATE XXVII.

Fig. 1.—*Scaptodon lodderi*, sp. nov. Inner face of tooth. Circ. natural size.

,, 2.—Ditto. Edge view.

,, 3.—Ditto. A thin transverse section of the tooth taken from the base, showing the external cement above and the ivory or dentine beneath. The cementum is perforated by the hyphae of a boring fungus. × 144.